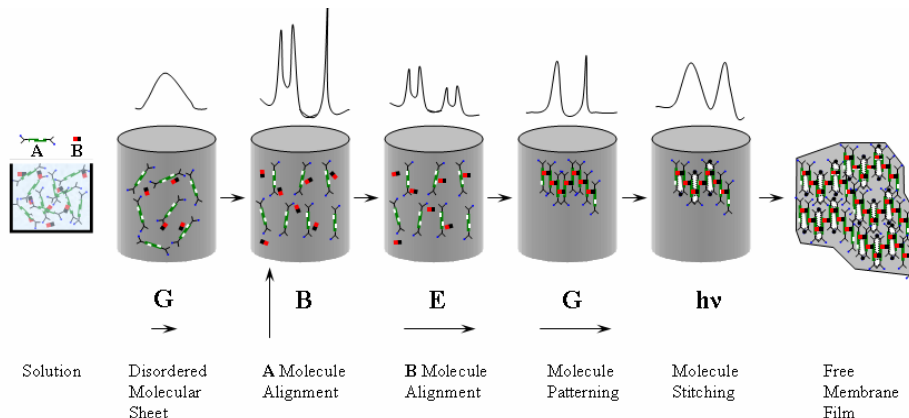


Molecule Nanoweaver

Rex Gerald II, Lela Vukovic, Rocio Diaz, Robert J. Klingler, Jerome W. Rathke

The Molecule Nanoweaver is a device under development for fabricating films and membranes (area ~1-5 square centimeters) composed of molecules arranged into nanometer-scale patterns by the application of external force fields (e.g., mass, shape, electric/magnetic moment.). These patterns can be made permanent by covalent bonds through light-induced chemical cross linking. Films fabricated using the Molecule Nanoweaver can be designed to have pores for the selective filtering of molecules having specified properties such as a particular shape or functional group. The patterning protocol requires forming a film in a spinning rotor and using combined fields to affect alignment of monomers into a specific arrangement. Nuclear magnetic resonance (NMR) spectroscopy and imaging are used to monitor the alignment and reaction processes in situ, as well as to characterize the nanostructure of the resulting film. Several differentiating features of the Molecule Nanoweaver over existing devices and methods include are discussed. A graphic outline of the general process of molecule nanoweaving and the latest experimental film results will be presented.

This work was supported by the U.S. Department of Energy, Division of Chemical Sciences, Office of Basic Energy Sciences, under Contract W-31-109-Eng-38.



**Argonne Innovation
BIO 2006**

Innovation Corridor: Nanotechnology

Tuesday, April 11, 9:00 AM - 12:00 PM



A U.S. Department of Energy laboratory managed by The University of Chicago